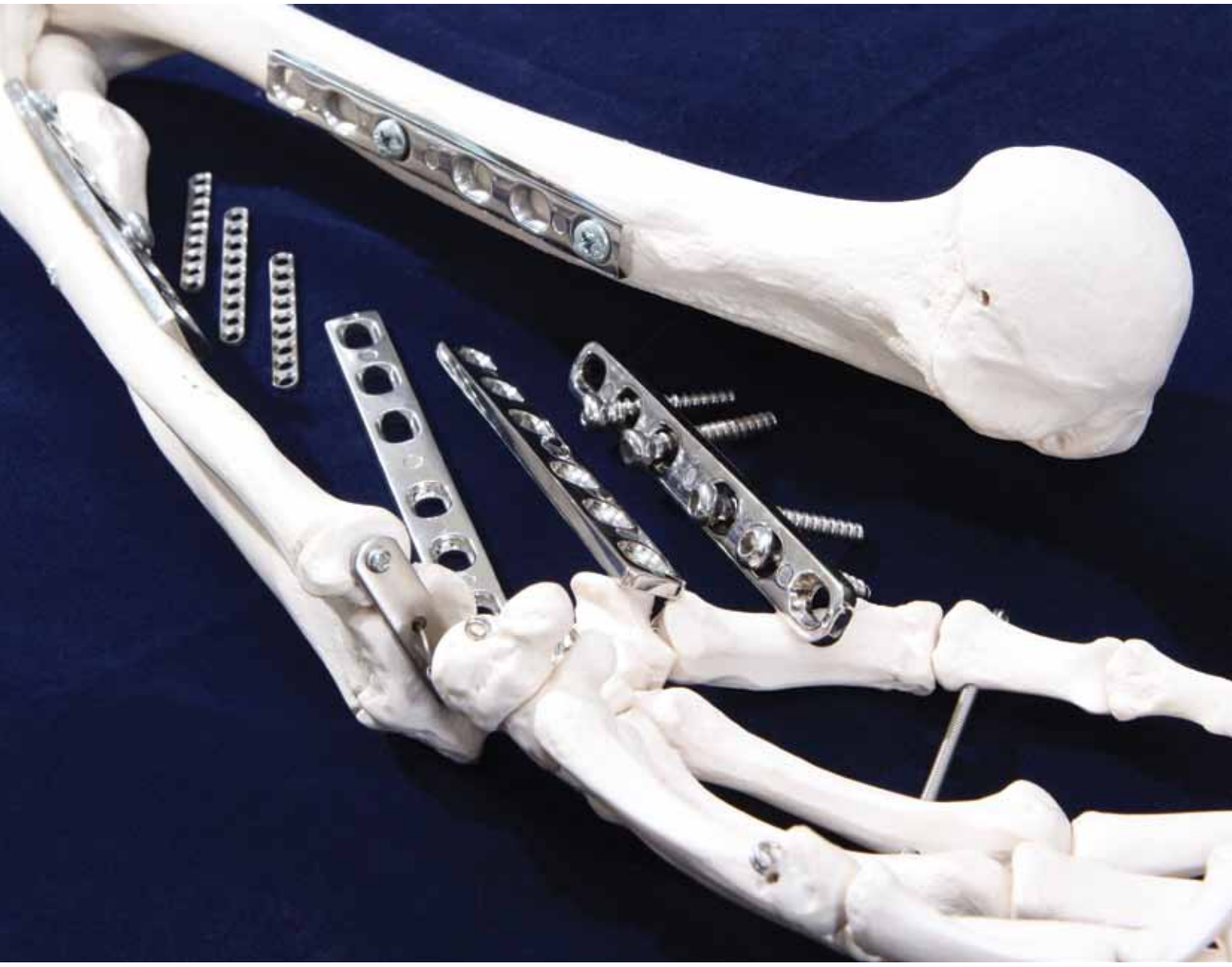
# MEDICAL TECHNOLOGY

Innovative technologies for the healthcare industry



SIRIM

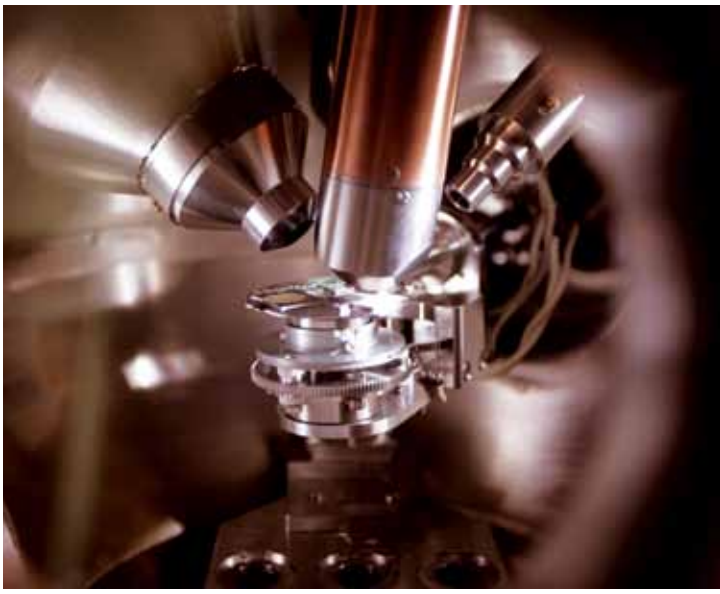
# Towards smarter healthcare

Home-grown solutions for drug delivery systems, implants/prostheses and medical equipment.

The average lifespan of Malaysians has increased from 63 years to 74 years due to rapid improvements in the country's healthcare systems. As the country's population ages, the healthcare sector will come under increasing pressure to deliver more cost–effective products and services. Indeed, the Malaysian healthcare market was worth USD 2.25 billion in 2012 and is expected to grow to USD 3.65 billion by 2018.

Through the utilisation of more home–grown medical technologies, our medical institutions and industries can become less reliant on expensive foreign–made devices and solutions and improve their competitiveness.

The opportunities in the medical industry are vast. SIRIM is at the forefront of the effort to develop Malaysia's national medical technology capabilities as well as other biomedical innovations.



Researchers at SIRIM use an x–ray photoelectron spectrometer (XPS) to analyse the surface chemistry of biomaterials used in the company's medical products.

## END-TO-END SOLUTIONS ACROSS THE VALUE CHAIN

### IDEATION & CONCEPTUALISATION

Business consultants evaluate the commercial potential of an idea to determine its viability given current market opportunities.

### PRODUCT DEVELOPMENT

Product designers and researchers collaborate to build a working prototype of the product along with a pilot plant that makes it.

### TRIALS & PRE-COMMERCIALISATION

Consultants help organise clinical trials for the product and ensure that its production is in line with GMP or GLP guidelines where necessary.

# MALAYSIAN TECHNOLOGIES. INTERNATIONAL STANDARDS.

SIRIM offers a wide scope of capabilities in research, development, design and engineering to help the healthcare industry find new medical solutions. We also offer consulting and technical services throughout the value chain to support businesses in the medical device industry.

Our medical technology researchers have incorporated high–technology innovations within three primary areas of focus: drug delivery systems, implants/ prostheses, and medical equipment and devices.

We have several medical and healthcare solutions in these areas that are ready for scale–up and commercialisation with more in the pipeline. Our multidisciplinary expertise in advanced materials, radio frequency identification (RFID), nanotechnology, biotechnology and bio–modelling is all available under one roof.

Titanium alloy implants for maxillofacial bone fractures.

## SCALE-UP & COMMERCIALISATION

Designers and engineers develop a full–scale manufacturing line for the new product that complies with necessary regulations.

## STANDARDS & QUALITY SERVICES

Consultants help ensure the product meets local and global medical device standards to increase its quality appeal and marketability abroad.

## TESTING & CERTIFICATION

The product is routinely tested and certified by an independent third–party to ensure it complies with applicable industry standards and regulations.

Chitosan has long been famous for its biocompatibility. Researchers at SIRIM have developed a skin regeneration system based on this wonder polysaccharide that allows wounds to heal inside out.

# Your competitive edge

SIRIM researchers have made important advances in the areas of drug delivery systems, implants/prostheses and medical equipment over the years. Many of these innovative technologies are available for licensing and commercialisation. If you have an idea we might not yet have explored, we would love to hear from you.

## DRUG DELIVERY SYSTEMS

All drug delivery systems and implants/prostheses are developed and tested according to Good Manufacturing Practices (GMP) guidelines in line with ISO 13485 Medical Device requirements.

- Implantable biodegradable polymers for site–specific drug delivery
- Nano–based drug delivery (dendrimer and hyperbranched Polymer)
- Microcapsules
- Antimicrobial coatings
- Medicated implants
- Implantable drug–filled biochips
- Active targeted drug delivery with biomedical imaging
- Transdermal patches

SIRIM's wound management products are biocompatible, biodegradable, hypoallergenic and antibacterial.

## IMPLANTS/PROSTHESES

We combine our expertise in biomaterials and medical science to create new techniques and solutions for making better implants and prostheses.

- Bone implants
- Dental implants

SIRIM's biomaterial implants have been used successfully in surgery.

## MEDICAL EQUIPMENT

SIRIM researchers and engineers develop home–grown medical equipment to make healthcare more efficient and affordable for Malaysians. Our current and future projects include:

- e–Heart
- Drug authentication system using RFID technology
- Customised accessories for wheelchair
- Portable dialysis machines
- Diagnostic equipment.


Medical equipment customisations improve the lives of the less fortunate.

# Benefit from our expertise

Over the years, SIRIM has successfully developed products and services in the area of medical technology to serve the needs of research institutions, businesses in the medical device industry and medical professionals.

### FOR MEDICAL RESEARCHERS

We offer testing services to medical researchers in the private sector and institutional research centres.

- Cytotoxicity and biocompatibility testing
- Material characterisation and analysis

### FOR MEDICAL BUSINESSES

Our technologies and innovations in the following areas are available for licensing to local and foreign businesses.

- Wound management systems
- Drug delivery systems
- Metal implants
- Ceramic implants

### FOR MEDICAL PROFESSIONALS AND INSTITUTIONS

Surgeons and healthcare providers may utilise our imaging services and facilities for treating trauma patients.

- Craniofacial treatment
- Rapid prototyping for prosthetic limbs
- Customisation of medical equipment

## OPPORTUNITIES FOR COLLABORATION

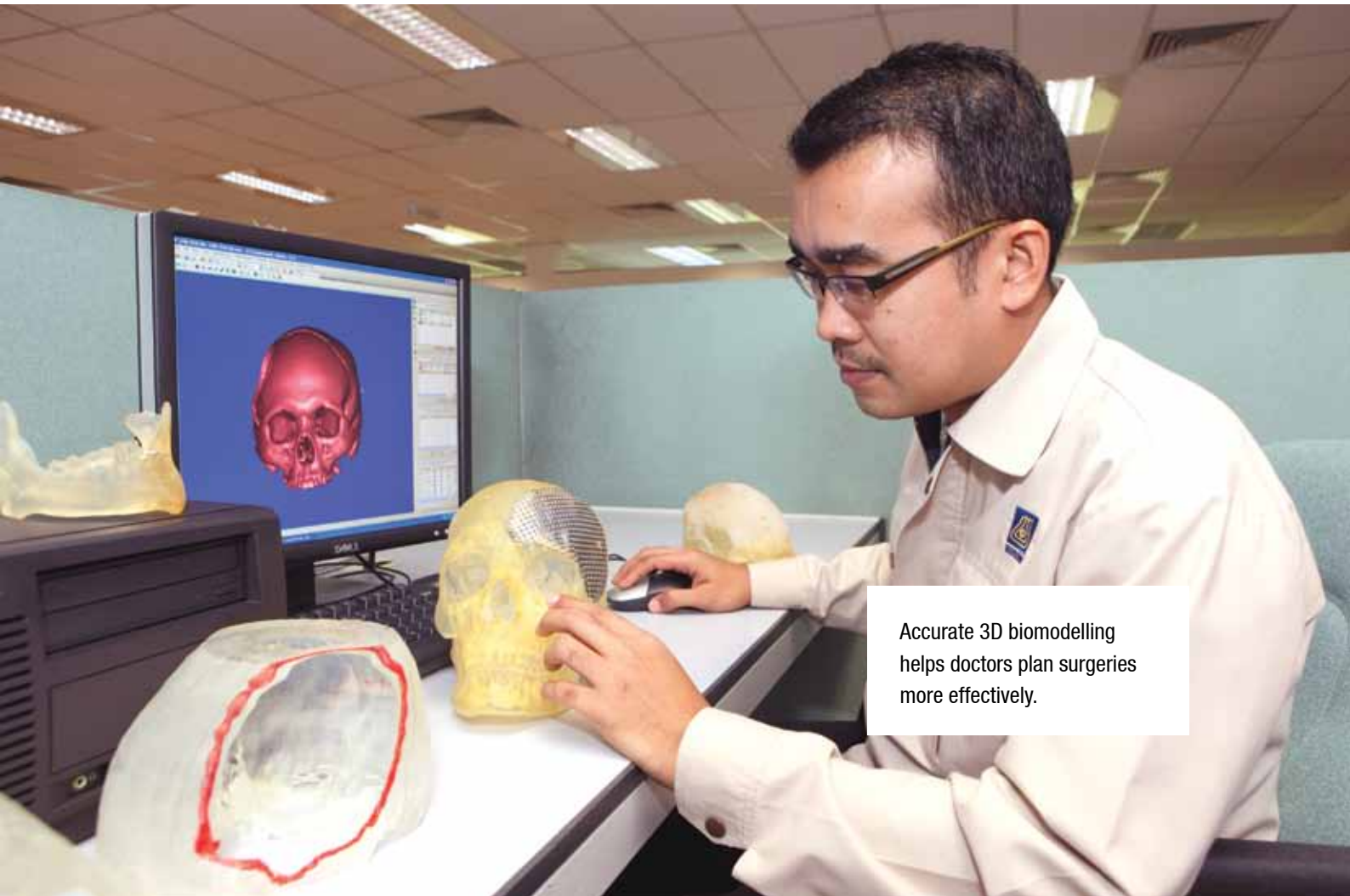
The medical device industry has been earmarked as a key strategic industry for the country. Contract manufacturing for medical devices was worth more than RM 134 billion in 2010 with a CAGR of 12–percent. With the right technologies and infrastructure, Malaysia has the potential to become a major medical device manufacturing hub.

SIRIM can help you take advantage of this opportunity. We are ready to collaborate with private and public agencies on research projects and would be happy to discuss how your organisation can benefit from our expertise. Contact us now to find out more about our services in:

- Contract research
- Contract testing of medical–related materials and products
- Commercialisation and commercial partnerships
- Technology licensing

## THE SIRIM ADVANTAGE

- **End–to–end solutions**: With over 40 years of experience as the national research and technology development body, we offer customers comprehensive capabilities in R&D, design and engineering, and standards, all under one roof. Our solutions cover the entire product life cycle from ideation to commercialisation.
- **Multi–disciplinary synergy**: Our industrial R&D activities span a full range of technologies and solutions with commercial potential in energy and environmental technologies, plant and machinery expertise and medical technology. Our experts integrate different engineering fields to develop innovative solutions for our customers.
- **Customer–driven**: SIRIM's solutions are tailored to the needs of modern enterprises. We combine technological innovation with business–oriented disciplines to deliver products and services that are relevant to the marketplace. We stay up–to–date with emerging trends and opportunities and are committed to delivering quality services to our clients.
- **Standards expertise**: We are the national standards development agency and we also serve as the WTO/TBT enquiry point in Malaysia. Our extensive expertise in standards, certification and regulatory compliance help ensure that your products meet the international standards and requirements of global markets.



Accurate 3D biomodelling helps doctors plan surgeries more effectively.


## Driving innovation through technology and quality

Incorporated in November 1995 as a wholly–owned Government company under the Minister of Finance Incorporated, SIRIM Berhad is a recognised industrial research and technology development institution.

With a vision to become a premier total solutions provider, we make businesses compete better through quality and technology innovations. Our technology focus areas are aligned with national strategic initiatives in energy and environmental technologies, plants and machinery expertise and medical technologies.

SIRIM

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